

I Status of the Claims

Claim 20 is pending and is at issue.

II Telephone Interview

Applicants would like to thank Examiner Fischer for the courtesies extended in the telephone interview of March 24, 2003.

III Rejections Under 35 U.S.C. § 103(a)

Claim 20 stands rejected under 35 U.S.C. §103(a) as obvious over Jackson (U.S. Patent 3,646,610) in view of Sugiyama (JP 08-131588), Kusumoto (U.S. Patent 6,106,413), Berg (U.S. Patent 5,984,804), applicants' admitted prior art, Lauratitis (U.S. Patent 4,000,896) and VanAuken (U.S. Patent 4,023,801). Claim 20 has also been rejected under 35 U.S.C. §103(a) as obvious over applicants' admitted prior art in view of Jackson, Sugiyama, Kusumoto, Lauratitis and Van Auken.

Applicants respectfully traverse the above rejection. The Examiner has not made a *prima facie* showing of obviousness as Jackson, Sugiyama, Kusumoto, Berg, Lauratitis and Van Auken do not, alone or in combination, teach or suggest every element of the claimed invention. Rather, the Examiner is improperly using hindsight to reject the claim.

Claim 20 is directed to a method for forming a golf club shaft by forming a patentable structure.

The fibers of any given layer can be in one of four positions, parallel to the longitudinal axis (0°), perpendicular to the longitudinal axis (90°), or positively or negatively angled to the longitudinal axis ($0^\circ < \Theta < 90^\circ = +\Theta$; $270^\circ < \Theta < 360^\circ = -\Theta$). Additionally, when two fiber materials are offset from the longitudinal axis and bonded together to form a single layer, the two fiber materials in that single layer form an angle.

TABLE 1

LAYER	FIBER MATERIAL	FIBER ORIENTATION TO LONGITUDINAL AXIS	LAYER ORIENTATION TO THE LONGITUDINAL AXIS
First Reinforcement	First	90°	90°
First Angled	Second	$+\Theta$	$0^\circ < 1^{\text{st}} \text{ Angle} < 90^\circ$ and/or
	Third	$+\Theta$	$270^\circ < 1^{\text{st}} \text{ Angle} < 360^\circ$
First Straight	Fourth	0°	0°
Second Angled	Fifth	$+\Theta$	$70^\circ \leq 2^{\text{nd}} \text{ Angle} \leq 150^\circ$
	Sixth	$+\Theta$	
Second Straight	Seventh	0°	0°
Second Reinforcement	Eighth	0°	0°

As discussed in the interview with the Examiner, the number, orientation and order of the layers result in the strength, flexural rigidity and light weight of the golf club shaft.

Prior to the arguments regarding the references, below is a table outlining the differences in the layering between one configuration of the invention of claim 20 and the prior art.

Present Invention	First Reinforcement (90°)	First Angled (Θ)		First Straight (0°)	Second Angled (Θ)		Second Straight (0°)	Second Reinforcement (0°)
	First Fiber 90°	Second Fiber +/-Θ	Third Fiber +/-Θ	Fourth Fiber 0°	Fifth Fiber +/-Θ	Sixth Fiber +/-Θ	Seventh Fiber 0°	0°
Jackson (Fig. 17)	Layer 60' (0°)	Layer 62' (Θ)		Layer 66' (0°)	Layer 68' (Θ)		Layer 72' (0°)	-
	0°	Layer 63' +/-Θ	Layer 64' +/-Θ	0°	Layer 69' +/-Θ	Layer 70' +/-Θ	0°	-
Jackson with "Chopped" layers	Layer 60' (0°)	Layer 62' (Θ)		Layer 65' (Θ)	Layer 66' (0°)	Layer 68' (Θ)		Layer 71' (Θ) Layer 72' (0°)
	0°	Layer 63' +/-Θ	Layer 64' +/-Θ	+/ -Θ	0°	Layer 69' +/-Θ	Layer 70' +/-Θ	+/ -Θ 0°
Sugiyama	Layer 103 (90°)	Layer 102 (0°)		Layer 101 (Θ)		-	-	-
	90°	0°		+/ -Θ	+/ -Θ	-	-	-
Kusumoto	Layer 1 (0°)	Layer 2 (90°)		Layer 3 (Θ)		Layer 4 (90°)	Layer 5 (0°)	Layer 6 (0°)
	0°	90°		Layer 3a +/-Θ	Layer 3b -/+Θ	90°	0°	0°

Berg	First Sheet 34 (0°)	Second Sheet 36 (Θ)		Third Sheet 38 (0°)	Fourth Sheet 40 (0°/90°)		-	-
	Fibers 42 0°	Fibers 63 +/- Θ	Fibers 66 +/- Θ	Fibers 70 0°	Fibers 82 0°	Fibers 82 90°	-	-
Lauraitis	Layer 33	Layer 34		Layer 35	Layer 36	Layer 37	Layer 38	Layer 40
	0°	+Θ		-Θ	+Θ	-Θ	+Θ	-Θ
VanAuken	First Layer 10 (Θ)	Third Layer 14 (Θ)		Second Layer 12 (Θ)	Layer 15 (Θ)			
	+/- Θ	+/- Θ	+/- Θ	+/- Θ	+/- Θ	+/- Θ		
Jackson combined with Sugiyama	Sugiyama Layer 103 (90°)	Jackson Layer 60' (0°)	Jackson Layer 62' (Θ)		Jackson Layer 66' (0°)	Jackson Layer 68' (Θ)		Jackson Layer 72' (0°)
	90°	0°	Layer 63' +/-Θ	Layer 64' +/-Θ	0°	Layer 69' +/-Θ	Layer 70' +/-Θ	0°

The Examiner states that Figure 17 of Jackson discloses the first angled layer (62'), the first straight layer (66'), the second angled layer (68') and the second straight layer (72') and not the first or second reinforcement layers. Applicants respectfully disagree. Figure 17 of Jackson discloses one of two arrangements. Neither arrangement discloses the six layers of the present invention.

One arrangement taught by Jackson is a five layer structure with a first straight layer (60'), a first angled layer (62'), a second straight layer (66'), a second angled layer (68') and a third straight layer (72'). However, present claim 20 recites that the layer wrapped around the mandrel (the first reinforcement layer) is perpendicular to the long axis of the golf

club shaft while Jackson's layer 60', which is closest to the mandrel, is parallel to the long axis of the golf club shaft. The Examiner is ignoring layer 60' and is improperly selecting only specific layers. Neither Jackson nor the combination of Jackson with the secondary references discloses omitting the base layer of Jackson's golf club shaft. Omitting a layer would weaken and alter the properties of the golf club shaft. Jackson teaches that that the layer closest to the mandrel must be parallel to the long axis of the golf club shaft. *See, Jackson Figures 8, 13, 14, 15, and 16.*

Another arrangement of layers taught and suggested by Jackson is a seven layer structure including a first straight layer (60'), a first angled layer (62'), a second angled layer (65') a second straight layer (66'), a third angled layer (68'), a fourth angled layer (71') and a third straight layer (72'). Layers 65' and 71' are "short, chopped fiber glass filaments ... disposed in random orientation." Jackson, column 5, lines 25-35. These are not the angled layers of the present invention. Also, Jackson teaches that the "chopped fibers ... oppose shear forces tending to fracture the shaft." Jackson, column 3, lines 55-58. Thus, one of ordinary skill in the art would be motivated, if anything, to omit layers 65' and 71', leaving only the straight layers.

The Examiner states that Sugiyama discloses a perpendicular first reinforcement layer and that since Sugiyama discloses it in proximity to a straight layer that it would have been obvious to combine Sugiyama with Jackson to obtain the method of forming a first reinforcement layer, first angled layer, first straight layer, second angled layer and second straight layer of the present invention. Applicants respectfully traverse the above rejection in

that Jackson and Sugiyama alone or in combination do not teach or suggest the method of the claimed invention.

Sugiyama discloses a perpendicular first reinforcement layer, a first straight layer and either a first angled layer or a first and second angled layer. Sugiyama's invention is different than to the presently claimed invention in that the present claim recites a method of forming a golf club shaft including a perpendicular first reinforcement layer, a first angled layer and a first straight layer. The Examiner further states that the motivation to combine Sugiyama and Jackson is that Sugiyama "suggests that a first reinforcement layer is especially important in proximity to a first straight layer." Paper No. 13, page 3, lines 1-2. However, the present invention does not place the first reinforcement layer next to a straight layer. Rather, it is next to an angled layer. Sugiyama does not teach or suggest that a first reinforcement layer should be placed next to an angled layer. Sugiyama clearly teaches that the first reinforcement layer, as stated by the Examiner, is especially important in proximity to a first straight layer. Thus, even if one of ordinary skill in the art is motivated to combine Sugiyama and Jackson (and Applicants submit that one is not), the resulting golf club shaft would contain a perpendicular first reinforcement layer, a straight layer, and an angled layer. This combination does not teach or suggest a method of forming the layers in the order in which they are claimed in the present invention.

The Examiner additionally states that it would be obvious to combine Sugiyama with Jackson because Jackson teaches that additional layers can be incorporated into the golf club shaft. One of ordinary skill in the art is not motivated to add layers to Jackson. Jackson

discloses a golf club shaft weighing 0.31 pounds or 140 grams. *See*, Jackson column 4, lines 1-12. The specification of the present invention discloses a golf club shaft weighing from about 30 to about 40 grams. Thus, Jackson's golf club shaft weighs approximately 3.5 to 4.5 times more than the golf club shaft of the present invention. One of ordinary skill in the art would not be motivated to add layers to reduce the weight of Jackson's golf club shaft.

Additionally, one of ordinary skill in the art would not be motivated to add another layer, the second reinforcement layer. Neither Jackson nor Sugiyama disclose or suggest that a second reinforcement layer is necessary for any improvement to the golf club shaft and, as stated above, one of ordinary skill in the art would not be motivated to add layers to unnecessarily add weight to Jackson's golf club shaft.

The Examiner states that Kusumoto teaches the second reinforcement layer. Again, Kusumoto does not disclose layers in the same orientation and order of the present invention. There is no motivation or suggestion that the particular reinforcement layers of Kusumoto would be obvious to combine with Jackson. Kusumoto's method of combining layers is not the method of the presently claimed invention. Jackson teaches away from using a partial reinforcing layer. Jackson states that his "shaft 10 comprises a plurality of continuous full-length longitudinally extending fibers[,] ... spirally wound fiber glass lengths 14, 15 exten[ing] the length of the shaft ... [and] an intermediate layer ... extending the full length of the shaft." Jackson, column 3, lines 19-35. Jackson further uses "glass choppings ... dispersed over the surface ... to oppose shear forces." Jackson, column 3, lines 31-58. Jackson teaches using chopped glass fibers along the full length of the golf club shaft to

reinforce a golf club shaft and does not teach or suggest using a partial reinforcement layer. Additionally, Jackson does not state that his configuration requires additional reinforcement. Jackson teaches away from using the partial reinforcement layer of Kusumoto, and Kusumoto's layers are not similar enough to either Jackson or the presently claimed invention for one of skill in the art to be motivated to add reinforcement.

In summary, none of the three above references disclose or suggest, alone or in combination, the entire claimed invention.

Applicants respectfully submit that the present invention provides a specific number, orientation, and specific ordering of the layers. The Examiner is treating mixing and matching layers as obvious without any specific, and sometimes conflicting, motivation. One of ordinary skill in the art, in general, would not be motivated to add or subtract a specific layer without direct teaching as this would affect the properties of the golf club shaft. One of skill in the art is not motivated to add layers, which increase the weight of the golf club shaft, or subtract layers, which reduce the strength of the golf club shaft, without specific motivation.

In conclusion, none of the references, alone or in combination, teach or suggest all of the elements of the presently claimed invention. Additionally, neither the references nor the Examiner's comments provide sufficient motivation to one of ordinary skill in the art to either combine the references or provide the teachings absent from the references. Thus, Applicants respectfully request that the above rejections be withdrawn.



CONCLUSION

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In view of the foregoing, it is believed that claim 20 is in condition for allowance and it is respectfully requested that the application be reconsidered and that the pending claim be allowed and that the case is passed to issue.

If there are any other issues remaining to be examined or believed to be resolved to either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Respectfully submitted,


Louis J. DelJuidice
Reg. No. 47,522
Agent for Applicants

DARBY & DARBY, P.C.
Post Office Box 5257
New York, N.Y. 10150-5257
Phone: (212) 527-7700